

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

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INVITATION TO PAY ADDITIONAL FEES
AND, WHERE APPLICABLE, PROTEST FEE
(PCT Article 17(3)(a) and Rule 40.1 and 40.2(e))

Applicant's or agent's file reference P92619pc00	Date of mailing (day/month/year) 29/04/2009
International application No. PCT/EP2009/051081	PAYMENT DUE within ONE MONTH from the above date of mailing
Applicant FOTONATION IRELAND LIMITED	International filing date (day/month/year) 30/01/2009

1. This International Searching Authority

- (i) considers that there are 3 (number of) inventions claimed in the international application covered by the claims indicated on an extra sheet:
- (ii) therefore considers that **the international application does not comply with the requirements of unity of invention** (Rules 13.1, 13.2 and 13.3) for the reasons indicated on an extra sheet:
- (iii) ☒ has carried out a partial international search (see Annex) ☐ will establish the international search report on those parts of the international application which relate to the invention first mentioned in claims Nos.:

see extra sheet
- (iv) will establish the international search report on the other parts of the international application only if, and to the extent to which, additional fees are paid.

2. Consequently, the applicant is hereby **invited to pay**, within the time limit indicated above, the amount indicated below:

EUR 1.700,00 x 2 = EUR 3.400
 Fee per additional invention number of additional inventions currency/total amount of additional fees

3. The applicant is informed that, according to Rule 40.2(c), **the payment of any additional fee may be made under protest**, i.e., a reasoned statement to the effect that the international application complies with the requirement of unity of invention or that the amount of the required additional fee is excessive, where applicable, subject to the payment of a protest fee.
- Where the applicant pays additional fees under protest, the applicant is hereby invited, within the time limit indicated above, to pay a protest fee (Rule 40.2(e)) in the amount of EUR 750,00 (currency/amount)

Where the applicant has not, within the time limit indicated above, paid the required protest fee, the protest will be considered not to have been made and the International Searching Authority will so declare.

4. ☐ Claim(s) Nos. _____ have been found to be unsearchable under Article 17(2)(b) because of defects under Article 17(2)(a) and therefore have not been included with any invention.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Claudia Flaßhar
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This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-14,23-25,28

Device and processor-readable media for detecting a possible red, yellow or golden eye defect in a digital image based on an eye gaze angle determined from meta-data and the content of the digital image.

2. claims: 15-21,26

Device and processor-readable media media for detecting a possible flash eye defect in a digital image based on a pupil size determined from ambient light at the time of image acquisition and other meta-data.

3. claims: 22,27

Device and processor readable media for detecting a possible half red eye defect in a digital image based on an expected orientation of the half red eye determined from a position of a light source relative to a lens.

1. Reference is made to the following documents:

D1: WO 2005/015896 A (ACCAPELLA VISION LTD [IE]; DELUCA MICHAEL J [US]; PRILUTSKY YURY [US];) 17 February 2005 (2005-02-17)

2. The present application relates to more than one invention which are not so linked as to form a single general inventive concept ("lack of unity of invention"), as required by Rule 13.1 PCT.

2.1 The separate inventions are the following.

The first invention is defined by claims 1-14, 23-25 and 28. It relates to a device and processor-readable media for detecting a possible red, yellow or golden eye defect in a digital image based on an eye gaze angle determined from meta-data and the content of the digital image.

The second invention is defined by claims 15-21 and 26. It relates to a device and processor-readable media for detecting a possible flash eye defect in a digital image based on a pupil size determined from ambient light at the time of image acquisition and other meta-data.

The third invention is defined by claims 22 and 27. It relates to a device and processor readable media for detecting a possible half red eye defect in a digital image based on an expected orientation of the half red eye determined from a position of a light source relative to a lens.

They are not so linked as to form a single general inventive concept

(Rule 13.1 PCT) for the following reasons.

2.2 The prior art has been identified as document D1.

2.2.1 With respect to the first invention as defined by claim 1, D1 discloses (the references in parentheses applying to this document)

- a portable digital image acquisition device (fig.1 block 100; p.7 1.5) comprising:
 - a lens (fig.1, lens 106);
 - a digital imaging capturing apparatus (fig.1 block 100; p.7 1.9);
 - a source of light for providing illumination during image capture (fig.1 flash 104);
 - logic for performing the following operations:
 - acquiring a digital image at a time (implicit from fig.8);
 - storing image acquisition data describing a condition at the time (fig.8 block 414 "meta-data");
 - determining a pupil size in the digital image (fig.8 block 810; p.13 1.17-28);
 - determining a course of action based, at least in part, on the image acquisition data and the pupil size (fig.8 block 830; p.13 1.17-28).

Claim 1 differs from D1 in that an eye gaze angle is determined instead of a pupil size.

With respect to the first invention as defined by claim 23, D1 discloses

- one or more processor-readable media having embedded code therein for programming a processor to perform a method of detecting a potential defect in an image (implicit from fig.1 block 130), the method comprising:
 - acquiring a digital image at a time (implicit from fig.8);
 - storing image acquisition data, wherein the image acquisition data includes at least one of a position of a source of light relative to a lens, a distance from a source of light to the lens, a focal length of the lens, a distance from a point on a digital image acquisition device to a subject, an amount of ambient light, or flash intensity (fig.8 block 414 "meta-data"; p.9 1.10-22, eg. "distance to the object", "focal length");
 - determining dynamic anthropometric data, wherein the dynamic anthropometric data includes one or more dynamically changing human body measurements, of one or more humans represented in said image, captured at said time (fig.8 block 800; p.11 1.7-26, pupil size; p.10 1.7 - p.12 1.26 for dynamic adaptation of pupil size to actual image);
 - determining a course of corrective action based, at least in part, on the image acquisition data and the dynamic anthropometric data (fig.8 block 830; p.13 1.1-12).

Thus D1 discloses all features of the first invention as defined by claim 23.

However, D1 does not disclose the determination of an eye gaze angle as defined by claim 24, dependent on claim 23.

Thus, whether defined by independent claim 1 or 23 plus 24, the first invention differs from D1 in that an eye gaze angle is determined. This determination of an eye gaze angle is thus considered the special technical feature of the first invention.

2.2.2 With respect to the second invention as defined by claim 15, D1 discloses (the references in parentheses applying to this document)

- one or more processor-readable media having embedded code therein for programming a processor to perform a method (implicit from fig.1 block 130), comprising:
- detecting a value indicative of various meta-data at a time when the image is acquired (fig.8 block 414 "meta-data", p.9 l.10-22);
- storing the value in association with the image (implicit);
- determining a course of action based, at least in part, on the value (fig.8 block 830).

Claim 15 differs from D1 in that a value indicative of ambient light is detected instead of or in addition to the various meta-data of D1. This detection and storage of the value indicative of the ambient light is thus considered the special technical feature of the second invention.

2.2.3 With respect to the third invention as defined by claim 22, D1 discloses (the references in parentheses applying to this document)

- one or more processor-readable media having embedded code therein for programming a processor to perform a method of detecting a potential defect in an image (implicit from fig.1 block 130), the method comprising:
- storing a value indicative of a camera parameters;
- using the value to identify an expected color of a red eye defect;
- identifying defect candidates in the image at least in part based on the expected color.

Claim 22 differs from D1 in that the camera parameters are or include the position of a source of light to a lens, and that instead of the color of the red eye defect, the orientation of a half-red eye defect is identified. These are thus the special technical features of the third invention.

2.3 In the following, the technical effects of the special technical features identified above are analysed. Also the problems solved by these features are identified.

2.3.1 (First invention) Depending on the eye gaze angle, either a red, yellow or golden eye defect or no defect at all can be expected in the image. Knowledge of the eye gaze angle thus allows a more precise determination of a potential eye color defect in the image. The problem solved is thus considered as improving the detection of a potential eye defect in an image, by expecting the defect having a certain color, or expecting no defect at all.

2.3.2 (Second invention) The ambient light affects the size of the pupil. Knowledge of the ambient light - in combination with other parameters such as distance from lens to subject - thus allows the determination of

an expected size of a pupil. When looking for a red eye defect, the search for potential candidate pupils can be restricted to specific expected sizes of the pupils. The problem solved is thus considered as improving further the criteria of pupil sizes when looking for potential red eye defects.

2.3.3 (Third invention) The position of the light source with respect to the lens on the camera indicates certain orientations of specifically shaped red eye defects, called half red eye defects. Knowledge of this position allows to expect a certain orientation of the defect, which in turn allows a more efficient search for these defects in the image. The problem solved is thus considered as introducing another criteria when looking for a red eye defect in an image, regarding to the orientation of a specific shape of a defect.

2.4 Regarding the special technical features as identified in section 2.2, it is apparent that they are different. Regarding the technical effects they provide and the problems they solve (section 2.3), it is apparent that also the effects provided and problems solved are different. Thus the special technical features cannot be considered corresponding.

Therefore, the three inventions as defined in section 2.1 are not so linked as to form a general inventive concept, contrary to the requirements of Rule 13(1) PCT. The application lacks unity.

**Annex to Form PCT/ISA/206
COMMUNICATION RELATING TO THE RESULTS
OF THE PARTIAL INTERNATIONAL SEARCH**

International Application No
PCT/EP2009/051081

1. The present communication is an Annex to the invitation to pay additional fees (Form PCT/ISA/206). It shows the results of the international search established on the parts of the international application which relate to the invention first mentioned in claims Nos.:
- see 'Invitation to pay additional fees'
2. This communication is not the international search report which will be established according to Article 18 and Rule 43.
3. If the applicant does not pay any additional search fees, the information appearing in this communication will be considered as the result of the international search and will be included as such in the international search report.
4. If the applicant pays additional fees, the international search report will contain both the information appearing in this communication and the results of the international search on other parts of the international application for which such fees will have been paid.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/015896 A (ACCAPELLA VISION LTD [IE]; DELUCA MICHAEL J [US]; PRILUTSKY YURY [US];) 17 February 2005 (2005-02-17) page 5, line 19 - page 18, line 15 -----	23-25, 28
X	US 5 231 674 A (CLEVELAND DIXON [US] ET AL) 27 July 1993 (1993-07-27) column 1, line 40 - column 7, line 46 -----	1-14
X	US 2003/161506 A1 (VELAZQUEZ BELIMAR [US] ET AL) 28 August 2003 (2003-08-28) paragraphs [0004], [0012] - [0044] -----	23, 28

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Patent Family Annex

Information on patent family members

International Application No

PCT/EP2009/051081

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 2005015896	A	17-02-2005	EP 1654865 A1	10-05-2006
			JP 2007503030 T	15-02-2007
US 5231674	A	27-07-1993	NONE	
US 2003161506	A1	28-08-2003	EP 1347417 A2	24-09-2003
			JP 2003344021 A	03-12-2003